

OEST 696: COMMUNICATING OCEAN SCIENCES
Syllabus for three-credit courses
Summer 2020

Assignments and Grading

1. Personal Story presentation (prepare prior to the workshop) (10 points)
 2. Background reading notes and questions for each session (10 total)
 3. Daily journal including notes on background reading assignments, reports and reflections on daily discussions and activities, observations (2 points per day, 10 total)
 4. Active participation in daily discussions and activities (2 points per day, 10 total)
 5. Unique teaching lesson and assessment plan (in pairs) 5 points for plan, 5 points for peer review of another pair's plan (10 total)
 6. Presentation of unique lesson plan (10 points)
 7. Implementation evaluation (online) (20 points)
- 90-100% = A, 80-90% = B, 70-80% =C

Tentative Schedule

Session 1: Saturday, 18 July 2020 AM

Introduction to Teaching and Learning

ASSIGNED READINGS:

1. U.S. Commission on Ocean Policy. (2004). "An Ocean Blueprint for the 21st Century: Final Report of the U.S. Commission on Ocean Policy".
2. Pew Oceans Commission Report to The Nation (2003). America's Living Oceans: Charting a Course for Sea Change.
3. Ocean Literacy: Essential Principles and Fundamental Concepts (pamphlet)

ACTIVITIES: Aloha Lines, Ice Cubes, String Theory, The Watershed Connection

Session 2: Saturday, 18 July 2020 PM

The Nature and Process of Science

ASSIGNED READING:

1. The Nature of Science and Habits Of Mind, from Benchmarks for Science Literacy, American Association for the Advancement of Science Project 2061 (1993). " 1993, Oxford University Press. Read - introduction and chapter 1.
2. Feynman, R. (1985). *The Amateur Scientist.*" *From: Surely You're Joking from Adventures of a Curious Character.* WW Norton & Co.
3. Roberts, M. (1992). Science, Technology, Education and Ethnicity: An Aotearoa/New Zealand perspective. The Royal Society of New Zealand, V50, 59-75.

ACTIVITIES: Beach Bucket, Beach Finds Curiosity, Sand Activity

LESSON PREPARATION: With a partner; discuss target audience (formal or informal education).
Brainstorm where you will do your teaching.

PRESENTATIONS Personal Story: This could be poster, powerpoint, short video clip, an activity table (for an informal setting), or something of your choice. Remember to tell your story: what or who inspired you, what is your work really like, what are you studying or researching, why is it important, what might be some implications of global environmental changes on your work?

Session 3: Sunday, 19 July 2020 AM

Teaching and Learning: Designing Activities and Contexts Motivations for Learning

ASSIGNED READING:

1. Falk, J.H. & L.D. Dierking. (2000). Chapter 1 and 8 in *Learning from Museums: Visitor Experiences and the Making of Meaning*. Walnut Creek, CA: AltaMira Press.
2. Bransford, J.D., A.L. Brown & R.R. Cocking, Eds. (1999) Ch 2 in *How People Learn: Brain, Mind, Experience and School*. National Academies Press
3. National Science Education Standards – recommendations for more/less emphasis

ACTIVITIES: Tide Pool Survival and Observations, Habitats

Session 4: Sunday, 19 July 2020 PM

Inquiring Minds

ASSIGNED READING:

1. Donovan, S.M. & J.D. Bransford. (2005). Ch1: Introduction. In S. M. Donovan & J. D. Bransford (Eds.), *How Students Learn: History, Mathematics, and Science in the Classroom* (pp. 1-28). Washington, D.C.: National Academies Press.
2. Bransford, J.D. & S.M. Donovan, (Eds). (2005). Ch3 and Ch9, (pp. 397-419) in *Scientific inquiry and how people learn in How students learn: history, mathematics, and science in the classroom*. Washington, D.C. National Academies Press.

ACTIVITY: Fish Wheel

LESSON PREPARATIONS

Session 5: Monday, 20 July 2020 AM

Blank Slates or Clever Minds: Building Ocean Knowledge

ASSIGNED READING:

1. Osborne, R. (2001). (pp. 75-91) Children's Own Concepts in W. Harlen (Ed.), *Primary Science: Taking the Plunge*. Portsmouth, NH. Heinemann.
2. Falk, J.H. & L.M. Adelman. (2003). Investigating the Impact of Prior Knowledge and Interest on Aquarium Visitor Learning. *Journal of Research in Science Teaching*, 40(2), 163-176.

ACTIVITIES: Fish Observations, Fish Features and Habitats

Session 6: Monday, 20 July 2020 PM

Questioning Strategies and Interaction

ASSIGNED READING:

1. Elstgeest, J. (2001). The Right Question at the Right Time. In W. Harlen (Ed), *Primary Science: Taking the Plunge* (pp. 36-45). Portsmouth, NH. Heinemann.
2. Jelly, S. (2001). Helping Children Raise Questions and - Answering Them. In W. Harlen (Ed.), *Primary Science: Taking the Plunge* (pp. 47-57).

ACTIVITIES: Got Seaweed?, Exploration Tank, Shrimp and Crab Investigation

Session 7: Tuesday, 21 July 2020 AM

Maui Ocean Center

Designing an Activity and Assessment and Evaluation in Formal and Informal Settings

ASSIGNED READING:

1. Allen, S. (2004). Designs for Learning: Studying Science Museum Exhibits That Do More Than Entertain. *Science Education. Special Issue: In Principle, In Practice: Perspectives on a Decade of Museum Learning Research (1994-2004)*, 88 (Suppl1), S17-S33.
2. Wiggins, G. and J. McTighe (1998). What Is Backward Design? from *Understanding by Design*, Merrill Prentice Hall. Read pp. 7-19
3. Assessment and the National Science Education Standards, National Academy of Sciences, pp. 11-21, 2001, National Academy Press.
4. Falk, J.H., & L.D. Dierking. (2000). Chapter 9 of *Learning from Museums: Visitor Experiences and the Making of Meaning*. Walnut Creek, CA: AltaMira Press

ACTIVITIES: Skin, Scales and Skulls; Marine Skull Cart; Shark Cart; Whale Cart

Session 8: Tuesday, 21 July 2020 PM

Maui Ocean Center

ASSIGNED READING:

1. Yalowitz, S.S. (2004). Evaluating visitor conservation research at the Monterey Bay Aquarium. *Curator*, 47(3), 283-298.
2. Orion, N. & A. Hofstein. (1994). Factors that influence learning during a scientific field trip in a natural environment. *Journal of Research in Science Teaching*, 31(10), 1097-1119
3. Gregory and Miller. (1998). Science in Public. (Ch. 5)
4. Nisbet et al. (2002). Knowledge, Reservations or Promise? *Communication Research*, 29 (5), 584-608

ACTIVITIES: Questioning Strategies, Activity Tables

Session 9: Wednesday, 22 July 2020 AM

Social & Cultural Impacts; Other Audiences: Media & Government; and Broader Impacts in Science

ASSIGNED READING:

1. Lewenstein, B. (2001). Who Produces Science Information for the Public? Ch. 2 in *Free-Choice Science Education: How We Learn Science Outside of School*. Teachers College, Columbia University.
2. Buldu, M. (2006). Young children's perceptions of scientists: a preliminary study *Educational Research*, 48 (1), 121-132.

3. The Case for Strengthening Assessment in the Science Classroom, from Classroom Assessment and the National Science Education Standards, National Academy of Sciences, pp. 11-21, " 2001, National Academy Press.
4. National Science Foundation RFP Broader Impacts Section.
5. National Oceanic & Atmospheric Association RFP Broader Impacts Section.
6. Sample science research proposal broader impacts section.

ACTIVITY: Guest Speakers:

Session 10: Wednesday, 22 July PM

Reflecting on Practice

ASSIGNED READING: Reflecting on Practice.

PRESENTATIONS: You will present on the design and implementation of your lesson, including changes and alterations that you made based on peer feedback as well as assessment information that you collected from your audience during or after the lesson. A written, one page abstract of your presentation is due at the time you present. You are encouraged to use powerpoint or other visual means of sharing your lesson.

ACTIVITY: Reflective strategies